3.2 AIR QUALITY AND CLIMATE CHANGE

3.2.1 INTRODUCTION

This section describes the proposed program's impacts on air quality and climate change. Specifically, it includes a description of the existing air quality, a summary of applicable regulations, and analyses of potential temporary and long-term impacts of the SERP on air quality. The methods of analysis for the SERP's emissions from temporary construction, long-term operations, odors, and toxic air contaminants (TACs) are consistent with the recommendations of the applicable air quality management districts or air pollution control districts (air districts). Mitigation measures are recommended as necessary to reduce significant air quality impacts.

The regulatory setting and environmental setting for climate change are presented in this section, but impacts are addressed in Chapter 5, "Other CEQA-Required Sections," as a part of the cumulative impact analysis. This is because it is unlikely that any single project by itself could have a significant impact on climate change related to its greenhouse gas (GHG) emissions alone. Likewise, even the totality of DWR's activities would not be likely to have any measurable effect on global or local climate. However, the cumulative effect of human activities has clearly been linked to quantifiable changes in the composition of the atmosphere, which in turn have been shown to be the main cause of global climate change (IPCC 2007).

3.2.2 REGULATORY SETTING

AIR QUALITY

Federal Plans, Policies, Regulations, and Laws

Clean Air Act

The Federal Environmental Protection Agency (EPA) has been charged with implementing federal air quality programs. EPA's air quality mandates are drawn primarily from the federal Clean Air Act (CAA), which was enacted in 1970. The most recent major amendments were made by Congress in 1990.

The CAA required EPA to establish national ambient air quality standards (NAAQS). EPA has established primary and secondary NAAQS for ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable particulate matter with an aerodynamic diameter of 10 micrometers or less (PM_{10}), fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less ($PM_{2.5}$), and lead. The primary standards protect the public health and the secondary standards protect public welfare.

The CAA also required each state to prepare an air quality control plan referred to as a State Implementation Plan (SIP). The federal Clean Air Act Amendments of 1990 (CAAA) added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is modified periodically to reflect the latest emissions inventories, planning documents, and applicable rules and regulations. EPA must review all SIPs to determine whether they conform to the mandates of the CAA and its amendments and to determine whether their implementation will achieve air quality goals. If EPA determines a SIP to be inadequate, a federal implementation plan that imposes additional control measures may be prepared for the nonattainment area. Failure to submit an approvable SIP or to implement the plan within the mandated time frame may cause sanctions to be applied to transportation funding and stationary air pollution sources in the air basin.

EPA also has programs for identifying and regulating TACs, or hazardous air pollutants (HAPs) in federal terms. Title III of the CAAA of 1990 directed EPA to issue national emissions standards for HAPs. The CAAA also required EPA to issue vehicle or fuel standards containing reasonable requirements that control toxic emissions, at a minimum addressing benzene and formaldehyde. Performance criteria were established to limit mobile-source emissions of toxics, including benzene, formaldehyde, and 1,3-butadiene. In addition, section 219 of the CAAA required the use of reformulated gasoline in selected areas with the most severe ozone nonattainment conditions to further reduce mobile-source emissions.

State Plans, Policies, Regulations, and Laws

California Clean Air Act

The California Air Resources Board (ARB) is responsible for coordinating and overseeing state and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA). The CCAA, which was adopted in 1988, required ARB to establish California ambient air quality standards (CAAQS). ARB has established CAAQS for sulfates, hydrogen sulfide, vinyl chloride, visibility-reducing particulate matter, and the above-mentioned criteria air pollutants. In most cases the CAAQS are more stringent than the NAAQS. Differences in the standards are generally explained by the health effects studies considered during the standard-setting process and the interpretation of the studies. In addition, the CAAQS incorporate a margin of safety to protect sensitive individuals.

The CCAA requires that all local air districts in the state strive to achieve and maintain the CAAQS by the earliest practicable date. The CCAA specifies that local air districts should focus particular attention on reducing the emissions from transportation and areawide emission sources and provides air districts with the authority to regulate indirect sources.

Among ARB's other responsibilities are overseeing local air districts' compliance with federal and California laws, approving local air quality plans, submitting SIPs to EPA, monitoring air

quality, determining and updating area designations, and setting emissions standards for new mobile sources, consumer products, small utility engines, off-road vehicles, and fuels. The ozone SIP and $PM_{2.5}$ SIP were due to EPA by June 2007 and April 2008, respectively. ARB and local air districts are currently developing plans for meeting new national air quality standards for ozone and $PM_{2.5}$. The draft statewide air quality plan was released in April 2007 (ARB 2008a). The SIP must show how each area will attain the federal standards. To do this, the SIP identifies the amount of pollution emissions that must be reduced in each area to meet the standard and the emission controls needed to reduce the necessary emissions.

Tanner Air Toxics Act

TACs in California are primarily regulated through the Tanner Air Toxics Act (Assembly Bill [AB] 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). AB 1807 sets forth a formal procedure for ARB to designate substances as TACs. Research, public participation, and scientific peer review must occur before ARB can designate a substance as a TAC. To date, ARB has identified more than 21 TACs and adopted EPA's list of HAPs as TACs. Most recently, particulate matter from diesel-fueled engines (diesel PM) was added to the ARB list of TACs. ARB published the *Air Quality and Land Use Handbook: A Community Health Perspective*, which provides guidance concerning land use compatibility with TAC sources (ARB 2005).

Regional and Local Plans, Policies, Regulations, and Ordinances

Regional Air District Plans and Rules

The SERP encompasses six California counties (Sacramento, Yolo, Solano, Sutter, Colusa, and Butte) overseen by five air districts. Each air district attains and maintains air quality conditions through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. Strategies include preparing plans for the attainment of ambient air quality standards, adopting and enforcing rules and regulations concerning sources of air pollution, and issuing permits for stationary sources of air pollution. Each air district also inspects stationary sources of air pollution and responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements programs and regulations required by the CAA and amendments thereof, and the CCAA.

Table 3.2-1 presents local rules and regulations applicable to the SERP. The rules outlined in Table 3.2-1 relate to the restriction of visible dust, fugitive dust, and nuisance emissions.

Table 3.2-1
Applicable Air District Rules and Regulations

Air District	Counties	Rule
Butte County AQMD	Butte	Rules 200, 201, 202, and 205
Feather River AQMD	Sutter	Rules 3.0, 3.2, and 3.3
Colusa County APCD	Colusa	Rules 2.10, 2.13, 2.15, and 2.16
Yolo-Solano AQMD	Yolo and Solano	Rules 2-5 and 2-11
Sacramento Metropolitan AQMD	Sacramento	Rules 402, 403, 404, and 405

Notes: AQMD = Air Quality Management District, APCD = Air Pollution Control District
Source: ARB 2009

Northern Sacramento Valley Planning Area

The air pollution control and air quality management districts for Shasta, Tehama, Glenn, Butte, Colusa, Sutter, and Yuba counties located in the northern portion of the Sacramento Valley together comprise the Northern Sacramento Valley Planning Area (NSVPA). These NSVPA districts have jointly prepared and submitted the 2006 *Air Quality Attainment Plan* (AQAP) in compliance with the requirements set forth in the CCAA, which specifically addressed the nonattainment status for ozone. The CCAA also requires a triennial assessment of the extent of air quality improvements and emissions reductions achieved through the use of control measures. As part of the assessment, the AQAP must be reviewed and, if necessary, revised to correct for deficiencies in progress and to incorporate new data or projections. The NSVPA districts anticipate submitting an ozone attainment plan (OAP) in 2013, as required by the CCAA.

This triennial update of the NSVPA AQAP addresses the progress made in implementing the 2003 plan and proposes strategy modifications for attaining the 1-hour ozone CAAQS at the earliest practicable date. The 2006 AQAP identifies those portions of the NSVPA designated as “nonattainment” for the CAAQS and discusses the health effects related to the various air pollutants. The AQAP identifies the air pollution problems that are to be cooperatively addressed on as many fronts as possible to make the region a healthier place to live now and in the future. As with the 1994, 1997, 2000, and 2003 AQAPs, the 2006 AQAP focuses on the adoption and implementation of control measures for stationary sources, areawide sources, and indirect sources, and addresses public education and information programs. The 2006 AQAP also addresses the effect that pollutant transport has on the ability of the NSVPA to meet and attain the CAAQS (NSVPA 2006).

Sacramento Metropolitan Planning Area

The Sacramento Metropolitan Air Quality Management District (SMAQMD), in coordination with the air quality management districts and air pollution control districts of El Dorado, Placer, Solano, Sutter, and Yolo counties, prepared and submitted the 1994 AQAP for the Sacramento Metropolitan Planning Area in compliance with the requirements set forth in the CCAA, which specifically addressed the nonattainment status for ozone and, to a lesser extent, CO and PM_{10}.

The CCAA also requires a triennial assessment of the extent of air quality improvements and emission reductions achieved through the use of control measures. As part of the assessment, the attainment plan must be reviewed and, if necessary, revised to correct for deficiencies in progress and to incorporate new data or projections. The requirement of the CCAA for a first triennial progress report and revision of the 1991 AQAP was fulfilled with the preparation and adoption of the 1994 OAP. The OAP stresses attainment of ozone standards and focuses on strategies for reducing ozone precursors, reactive organic gases (ROG) and oxides of nitrogen (NO_X). It promotes active public involvement, enforcement of SMAQMD rules and regulations, public education in the public and private sectors, development and promotion of transportation and land use programs designed to reduce vehicle miles traveled in the region, and implementation of control measures for stationary and mobile sources. The OAP became part of the SIP in accordance with the requirements of the CAAA and amended the 1991 AQAP. However, at that time, the region could not show that 1-hour ozone NAAQS would be met by 1999. In exchange for moving the deadline to 2005, the region accepted a designation of "severe nonattainment" coupled with additional emissions requirements on stationary sources. Additional triennial reports were also prepared in 1997, 2000, 2003, and 2006 in compliance with the CCAA and act as incremental updates (SMAQMD 2009a).

GLOBAL CLIMATE CHANGE

Federal Plans, Policies, Regulations, and Laws

Supreme Court Ruling on California Clean Air Act Waiver

EPA is the federal agency responsible for implementing the CAA. The U.S. Supreme Court ruled on April 2, 2007, that CO_2 is an air pollutant as defined under the CAA, and that EPA has the authority to regulate GHG emissions. See the discussion of Assembly Bill (AB) 1493 in Table 3.2-2, presented below in the discussion of State regulations, for further information on California's CAA waiver.

Mandatory Greenhouse Gas Reporting Rule

On September 22, 2009, EPA released its final Greenhouse Gas Reporting Rule (Reporting Rule). The Reporting Rule is a response to the fiscal year (FY) 2008 Consolidated Appropriations Act (H.R. 2764; Public Law 110-161), that required EPA to develop "…

mandatory reporting of greenhouse gases above appropriate thresholds in all sectors of the economy…." The Reporting Rule would apply to most entities that emit 25,000 metric tons of carbon dioxide equivalents (CO_2e) or more per year. Starting in 2010, facility owners are required to submit an annual GHG emissions report with detailed calculations of facility GHG emissions. The Reporting Rule would also mandate recordkeeping and administrative requirements for EPA to verify annual GHG emissions reports.

Environmental Protection Agency Endangerment and Cause and Contribute Findings

On December 7, 2009, the Administrator signed two distinct findings regarding greenhouse gases under section 202(a) of the Clean Air Act:

- **Endangerment Finding:** The current and projected concentrations of the six key well-mixed greenhouse gases—carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6)—in the atmosphere threaten the public health and welfare of current and future generations.
- **Cause or Contribute Finding:** The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.

State Plans, Policies, Regulations, and Laws

Table 3.2-2 summarizes the current State laws and Executive Orders within California that address climate change. Any item shown below with an asterisk is explained in further detail because it represents the most significant laws and orders to date.

California Environmental Quality Act and SB 97

The California Environmental Quality Act (CEQA) requires lead agencies to consider the reasonably foreseeable adverse environmental effects of projects they are considering for approval. GHG emissions have the potential to adversely affect the environment because they contribute to global climate change. In turn, global climate change has the potential to raise sea levels, affect rainfall and snowfall, and affect habitat.

Senate Bill 97

The provisions of Senate Bill 97, enacted in August 2007 as part of the State Budget negotiations and codified at section 21083.05 of the Public Resources Code, direct the Office of Planning and Research (OPR) to propose CEQA Guidelines "for the mitigation of GHG emissions or the effects of GHG emissions." SB 97 directs OPR to develop such Guidelines by July 2009, and directs the State Resources Agency (now Natural Resources Agency), the agency charged with adopting the CEQA Guidelines, to certify and adopt such Guidelines by

Table 3.2-2 Summary of State Laws and Executive Orders that Address Climate Change			
Legislation Name	**Signed into Law/ Ordered**	**Description**	**CEQA Relevance**
SB 1771	09/2000	Established California Climate Registry to develop protocols for voluntary accounting and tracking of GHG emissions.	In 2007, DWR began tracking GHG emissions for all departmental operations.
AB 1493	07/2002	Directed ARB to establish fuel standards for noncommercial vehicles that would provide the maximum feasible reduction of GHGs.	Reduction of GHG emissions from noncommercial vehicle travel.
SB 1078, SB 107, EO S-14-08, EO-S-21-09, and SBX1-2	09/2002, 09/2006, 11/2008, 9/2009, and 4/2011	Established renewable energy goals as a percentage of total energy supplied in the State. ARB approved a Renewable Electricity Standard regulation on September 23, 2010. SBX1-2 set the renewables portfolio standard target to 33 percent by December 31, 2020.	Reduction of GHG emissions from purchased electrical power.
EO S-3-05, AB 32*	06/2005, 09/2006	Established statewide GHG reduction targets and biennial science assessment reporting on climate change impacts and adaptation and progress toward meeting GHG reduction goals.	Projects must be consistent with statewide GHG reduction plan and reports will provide information for climate change adaptation analysis.
SB 1368	9/2006	Established GHG emission performance standards for base load electrical power generation.	Reduction of GHG emissions from purchased electrical power.
EO S-1-07	01/2007	Established Low Carbon Fuel Standard.	Reduction of GHG emissions from transportation activities.
SB 97*	08/2007	Directed the Governor's Office of Planning and Research to develop guideline amendments for the analysis of climate change in CEQA documents.	Requires climate change analysis in all CEQA documents.
SB 375	09/2008	Required metropolitan planning organizations to include sustainable communities' strategies in their regional transportation plans.	Reduction of GHG emissions associated with housing and transportation.

Table 3.2-2 Summary of State Laws and Executive Orders that Address Climate Change			
Legislation Name	**Signed into Law/ Ordered**	**Description**	**CEQA Relevance**
EO S-13-08*	11/2008	Directed the Natural Resources Agency to work with the National Academy of Sciences to produce a California Sea Level Rise Assessment Report and directs CAT to develop a California Climate Adaptation Strategy.	Information in the reports will provide information for climate change adaptation analysis.
Source: Data compiled by AECOM 2011			

January 2010. In April 2009, OPR prepared draft CEQA Guidelines and submitted them to the Natural Resources Agency (see below). On July 3, 2009, the Natural Resources Agency began the rulemaking process established under the Administrative Procedure Act. The Natural Resources Agency adopted those guidelines on December 30, 2009, and the guidelines became effective March 18, 2010.

The Natural Resources Agency-adopted amendments for GHGs fit within the existing CEQA framework for environmental analysis, which calls for lead agencies to determine baseline conditions and levels of significance, and to evaluate mitigation measures. The guideline amendments do not identify a threshold of significance for GHG emissions nor do they prescribe assessment methodologies or specific mitigation measures. The guideline amendments encourage lead agencies to consider many factors in performing a CEQA analysis, but preserve the discretion that CEQA grants lead agencies to make their own determinations based on substantial evidence.

CEQA Guidelines section 15064.4, *Determining the Significance of Impacts from Greenhouse Gas Emissions*, encourages lead agencies to consider three factors to assess the significance of GHG emissions: (1) will the project increase or reduce GHGs as compared to baseline; (2) will the project's GHG emissions exceed the lead agency's threshold of significance; and (3) does the project comply with regulations or requirements to implement a statewide, regional, or local GHG reduction or mitigation plan. CEQA Guidelines section 15064.4 also recommends that lead agencies make a good-faith effort, based on available information, to describe, calculate or estimate the amount of GHG emissions associated with a project.

CEQA Guidelines section 15126.4, *Consideration and Discussion of Mitigation Measures Proposed to Minimize Significant Effects*, includes considerations for lead agencies related to feasible mitigation measures to reduce GHG emissions, including but not limited to project

features, project design, or other measures which are incorporated into the project to substantially reduce energy consumption or GHG emissions; compliance with the requirements in a previously approved plan or mitigation program for the reduction or sequestration of GHG emissions, which plan or program provides specific requirements that will avoid or substantially lessen the potential impacts of the project; and measures that sequester carbon or carbon-equivalent emissions. In addition, amended CEQA Guidelines section 15126.4 includes a requirement that where mitigation measures are proposed for reduction of GHG emissions through off-site measures or purchase of carbon offsets, these mitigation measures must be part of a reasonable plan of mitigation that the relevant agency commits itself to implementing.

In addition, as part of the CEQA Guideline amendments and additions, a new set of environmental checklist questions (VII. *Greenhouse Gas Emissions*) was added to the CEQA Guidelines Appendix G. The new set asks whether a project would:

a) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?

Preliminary Draft Staff Proposal: Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under CEQA

CEQA gives discretion to lead agencies to establish thresholds of significance based on individual circumstances. To assist in that exercise, and because OPR believes the unique nature of GHGs warrants investigating a statewide threshold of significance for GHG emissions, OPR engaged the ARB technical staff to recommend a methodology for setting thresholds of significance. In October 2008, ARB released *Preliminary Draft Staff Proposal: Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under the California Environmental Quality Act* (ARB 2008b). This draft proposal included a conceptual approach for thresholds associated with industrial, commercial, and residential projects. For nonindustrial projects, the steps to concluding that an impact related to climate change would be less than significant generally include analyzing whether the project is exempt under existing statutory or categorical exemptions; complies with a previously approved plan or target; meets specified minimum performance standards; and falls below an as-yet-unspecified annual emissions level (ARB 2008c). The performance standards focus on construction activities, energy and water consumption, generation of solid waste, and transportation. For industrial projects, the draft proposal recommends a tiered analysis procedure similar to the procedure for nonindustrial projects. However, for industrial projects a quantitative annual emissions limit for less-than-significant impacts is established at

~7,000 metric tons of CO_2e. To date, these standards have not been adopted or finalized as a basis to evaluate the significance of a project's contribution to climate change.

Executive Order S-3-05

Executive Order (EO) S-3-05 made California the first state to formally establish GHG emissions reduction goals. EO S-3-05 includes the following GHG emissions reduction targets for California:

- by 2010, reduce GHG emissions to 2000 levels;
- by 2020, reduce GHG emissions to 1990 levels; and
- by 2050, reduce GHG emissions to 80 percent below 1990 levels.

The final emission target of 80 percent below 1990 levels would put the state's emissions in line with estimates of the required worldwide reductions needed to bring about long-term climate stabilization and avoidance of the most severe impacts of climate change (IPCC 2007).

EO S-3-05 also dictated that the Secretary of the California Environmental Protection Agency coordinate oversight of efforts to meet these targets with the Secretary of the Business, Transportation and Housing Agency; Secretary of the Department of Food and Agriculture; Secretary of the Resources Agency; Chairperson of the Air Resources Board; Chairperson of the Energy Commission; and the President of the Public Utilities Commission. This group was subsequently named the Climate Action Team (CAT).

As laid out in the EO, the CAT has submitted biannual reports to the governor and State legislature describing progress made toward reaching the targets. The CAT is in the process of finalizing their second biannual report on the effects of climate change on California's resources.

Assembly Bill 32

In 2006, California passed the California Global Warming Solutions Act of 2006 (Assembly Bill No. 32; California Health and Safety Code Division 25.5, sections 38500, et seq., or AB 32). AB 32 further details and puts into law the mid-term GHG reduction target established in EO S-3-05—reduce GHG emissions to 1990 levels by 2020. AB 32 also identifies ARB as the state agency responsible for the design and implementation of emissions limits, regulations, and other measures to meet the target.

The statute lays out the schedule for each step of the regulatory development and implementation.

- By June 30, 2007, ARB had to publish a list of early-action GHG emission reduction measures.

- Prior to January 1, 2008, ARB had to: identify the current level of GHG emissions by requiring statewide reporting and verification of GHG emissions from emitters and identify the 1990 levels of California GHG emissions.
- By January 1, 2010, ARB had to adopt regulations to implement the early-action measures.

In December 2007, ARB approved the 2020 emission limit (1990 level) of 427 million metric tons of CO_2 equivalents of GHGs. The 2020 target requires the reduction of 169 million metric tons of CO_2e, or approximately 30 percent below the state's projected "business-as-usual" 2020 emissions of 596 million metric tons of CO_2e. ARB updated 2020 estimates of GHG emissions to account for new estimates for future fuel and energy demand, the effects of the recent economic recession, and other factors (ARB 2010). The 2020 "business as usual" (no action is taken) scenario would need to be reduced by 15.75 percent to get to 1990 levels, according to analysis provided by ARB. Also in December 2007, ARB adopted mandatory reporting and verification regulations pursuant to AB 32. The regulations became effective January 1, 2009, with the first reports covering 2008 emissions. The mandatory reporting regulations require reporting for major facilities, those that generate more than 25,000 metric tons/year of CO_2e. To date ARB has met all of the statutorily mandated deadlines for promulgation and adoption of regulations.

Climate Change Scoping Plan

On December 11, 2008, pursuant to AB 32, ARB adopted the Climate Change Scoping Plan. This plan outlines how emissions reductions will be achieved from significant sources of GHGs via regulations, market mechanisms, and other actions. Six key elements, outlined in the scoping plan, are identified to achieve emissions reduction targets:

- expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- achieving a statewide renewable energy mix of 33 percent;
- developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;
- adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and

- creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the state's long-term commitment to AB 32 implementation.

The Climate Change Scoping Plan also included recommended 39 measures that were developed to reduce GHG emissions from key sources and activities while improving public health, promoting a cleaner environment, preserving our natural resources, and ensuring that the impacts of the reductions are equitable and do not disproportionately impact low-income and minority communities. These measures also put the state on a path to meet the long-term 2050 goal of reducing California's GHG emissions to 80 percent below 1990 levels. The measures in the approved Climate Change Scoping Plan will be developed over the next two years and be in place by 2012.

Executive Order S-13-08

EO S-13-08, issued November 14, 2008, directs DWR, the California Natural Resources Agency, Office of Planning and Research, Energy Commission, State Water Resources Control Board, State Parks Department, and California's coastal management agencies to participate in a number of planning and research activities to advance California's ability to adapt to the impacts of climate change. The order specifically directs agencies to work with the National Academy of Sciences to initiate the first California Sea Level Rise Assessment and to review and update the assessment every 2 years after completion; immediately assess the vulnerability of the California transportation system to sea level rise; and to develop a California Climate Change Adaptation Strategy.

California Climate Change Adaptation Strategy

In cooperation and partnership with multiple state agencies, the 2009 California Climate Adaptation Strategy summarizes the best known science on climate change impacts in seven specific sectors (public health, biodiversity and habitat, ocean and coastal resources, water management, agriculture; forestry, and transportation and energy infrastructure) and provides recommendations on how to manage against those threats.

Regional and Local Plans, Policies, Regulations, and Ordinances

The ARB Scoping Plan (January 2009) ("The Scoping Plan") states that local governments are "essential partners" in the effort to reduce GHG emissions. The Scoping Plan also acknowledges that local governments have "broad influence and, in some cases, exclusive jurisdiction" over activities that contribute to significant direct and indirect GHG emissions through their planning and permitting processes, local ordinances, outreach and education efforts, and municipal operations. Many of the proposed measures to reduce GHG emissions

rely on local government actions. The Scoping Plan encourages local governments to reduce GHG emissions by approximately 15 percent from current levels by 2020 (ARB 2008d).

In December 2009, SMAQMD adopted a revised *Guide to Air Quality Assessment* that requires quantification of GHG emissions and requires that each project comply with the intent of AB 32 (SMAQMD 2009b).

3.2.3 ENVIRONMENTAL SETTING

The Phase 1 SERP coverage area is located in the Sacramento Valley Air Basin (SVAB). The SVAB comprises all of Butte, Colusa, Glenn, Western Placer, Sacramento, Shasta, Sutter, Tehama, Yolo, and Yuba counties and the eastern portion of Solano County. The air districts in these jurisdictions work together to develop plans to bring the current ozone nonattainment designation for the area into compliance, as discussed above.

The nonattainment-transitional designation is given to nonattainment areas that are progressing and nearing attainment. The most recent attainment designations with respect to the SVAB are shown in Table 3.2-3 for each criteria air pollutant.

GLOBAL CLIMATE CHANGE

Global warming is the name given to the increase in the average temperature of the Earth's near-surface air and oceans since the mid-20th century and its projected continuation. Warming of the climate system is now considered to by unequivocal (IPCC 2007) with global surface temperature increasing approximately 1.33°F over the last 100 years. Continued warming is projected to increase global average temperature between 2 and 11°F over the next 100 years.

The causes of this warming have been identified as both natural processes and as the result of human actions. The Intergovernmental Panel on Climate Change (IPCC) concludes that variations in natural phenomena such as solar radiation and volcanoes produced most of the warming from pre-industrial times to 1950 and had a small cooling effect afterward. However, after 1950, increasing greenhouse gas concentrations resulting from human activity such as fossil fuel burning and deforestation have been responsible for most of the observed temperature increase. These basic conclusions have been endorsed by more than 45 scientific societies and academies of science, including all of the national academies of science of the major industrialized countries. Since 2007, no scientific body of national or international standing has maintained a dissenting opinion.

Table 3.2-3
Summary of Ambient Air Quality Standards for the Sacramento Valley Air Basin

Pollutant	Averaging Time	California		National Standards [1]		
		Standards[2,3]	Attainment Status[4]	Primary[3,5]	Secondary[3,6]	Attainment Status[7]
Ozone	1-hour	0.09 ppm (180 µg/m^3)	N (Moderate /Serious)	–	–	–
	8-hour	0.070 ppm (137 µg/m^3)	–	0.075 ppm (147 µg/m^3)	Same as Primary Standard	N (Butte, S. Sutter, Sac, Solano, Yolo)/ U SVAB)
Carbon Monoxide (CO)	1-hour	20 ppm (23 mg/m^3)	U/A	35 ppm (40 mg/m^3)	–	U/A
	8-hour	9 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)		
Nitrogen Dioxide (NO_2)[8]	Annual Arithmetic Mean	0.030 ppm (56 µg/m^3)	–	0.053 ppm (100 µg/m^3)	Same as Primary Standard	U/A
	1-hour	0.18 ppm (338 µg/m^3)	A	–		–
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	–	–	0.030 ppm (80 µg/m^3)	–	U
	24-hour	0.04 ppm (105 µg/m^3)	A	0.14 ppm (365 µg/m^3)	–	
	3-hour	–	–	–	0.5 ppm (1,300 µg/m^3)	
	1-hour	0.25 ppm (655 µg/m^3)	A	–	–	–
Respirable Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 µg/m^3	N	-	Same as Primary Standard	N (Sac Co) /U (SVAB)
	24-hour	50 µg/m^3		150		

Table 3.2-3
Summary of Ambient Air Quality Standards for the Sacramento Valley Air Basin

Pollutant	Averaging Time	California		National Standards [1]		
		Standards[2,3]	Attainment Status[4]	Primary[3,5]	Secondary[3,6]	Attainment Status[7]
				µg/m^3		
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 µg/m^3	U/A/N	15 µg/m^3	Same as Primary Standard	U
	24-hour	–	–	35 µg/m^3		
Lead [9]	30-day Average	1.5 µg/m^3	A	–	–	–
	Calendar Quarter	–	–	1.5 µg/m^3	Same as Primary Standard	
Sulfates	24-hour	25 µg/m^3	A	No National Standards		
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m^3)	U			
Vinyl Chloride[9]	24-hour	0.01 ppm (26 µg/m^3)	U/A			
Visibility-Reducing Particle Matter	8-hour	Extinction coefficient of 0.23 per kilometer—visibility of 10 miles or more (0.07–30 miles or more for Lake Tahoe) because of particles when the relative humidity is less than 70%.	U	No National Standards		

Table 3.2-3
Summary of Ambient Air Quality Standards for the Sacramento Valley Air Basin

Pollutant	Averaging Time	California		National Standards [1]		
		Standards[2,3]	Attainment Status[4]	Primary[3,5]	Secondary[3,6]	Attainment Status[7]

Notes: $\mu g/m^3$ = micrograms per cubic meter; ppm = parts per million

[1] National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic means) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. The PM_{10} 24-hour standard is attained when 99 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. The $PM_{2.5}$ 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the EPA for further clarification and current federal policies.

[2] California standards for ozone, CO (except Lake Tahoe), SO_2 (1- and 24-hour), NO_2, particulate matter, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in section 70200 of Title 17 of the California Code of Regulations.

[3] Concentration expressed first in units in which it was issued (i.e., ppm or $\mu g/m^3$). Equivalent units given in parentheses are based on a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[4] Unclassified (U): The data are incomplete and do not support a designation of attainment or nonattainment.
Attainment (A): The state standard for that pollutant was not violated at any site in the area during a 3-year period.
Nonattainment (N): There was at least one violation of a state standard for that pollutant in the area.
Nonattainment/Transitional (NT) (a subcategory of the nonattainment designation): The area is close to attaining the standard for that pollutant.

[5] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

[6] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[7] Nonattainment (N): Any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant.
Attainment (A): Any area that meets the national primary or secondary ambient air quality standard for the pollutant.
Unclassifiable (U): Any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant.

[8] On February 19, 2008, the California Office of Administrative Law approved a new NO_2 ambient air quality standard, which lowers the 1-hour standard to 0.19 ppm and establishes a new annual standard of 0.030 ppm. These changes became effective March 20, 2008.

[9] The California Air Resources Board has identified lead and vinyl chloride as toxic air contaminants with no threshold of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

Sources: ARB 2011, EPA 2012

Increases in greenhouse gas concentrations in the Earth's atmosphere are thought to be the main cause of human induced climate change. Greenhouse gases naturally trap heat by impeding the exit of solar radiation that has hit the Earth and is reflected back into space. Some greenhouse gases occur naturally and are necessary for keeping the Earth's surface inhabitable. However, increases in the concentrations of these gases in the atmosphere during the last 100 years have decreased the amount of solar radiation that is reflected back into space, intensifying the natural greenhouse effect and resulting in the increase of global average temperature.

The principal greenhouse gases are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), perfluorocarbons (PFC), hydrofluorocarbons (HFC), and water

vapor. Each of the principal greenhouse gases has a long atmospheric lifetime (one year to several thousand years). In addition, the potential heat trapping ability of each of these gases vary significantly from one another. Methane is 23 times as potent as carbon dioxide, while sulfur hexafluoride is 22,200 times more potent than carbon dioxide. Conventionally, greenhouse gases have been reported as carbon dioxide equivalents (CO_2e). CO_2e takes into account the relative potency of non-CO_2 greenhouse gases and converts their quantities to an equivalent amount of CO_2 so that all emissions can be reported as a single quantity.

The primary human-made processes that release these gases include: burning of fossil fuels for transportation, heating and electricity generation; agricultural practices that release methane such as livestock grazing and crop residue decomposition; and industrial processes that release smaller amounts of high global warming potential gases such as SF_6, PFCs, and HFCs. Deforestation and land cover conversion have also been identified as contributing to global warming by reducing the Earth's capacity to remove CO_2 from the air and altering the Earth's albedo or surface reflectance, allowing more solar radiation to be absorbed.

Global Climate Trends and Associated Impacts

The rate of increase in global average surface temperature over the last 100 years has not been consistent; the last three decades have warmed at a much faster rate – on average 0.32°F per decade. Eleven of the 12 years from 1995 to 2006, rank among the 12 warmest years in the instrumental record of global average surface temperature (going back to 1850) (IPCC 2007).

During the same period over which this increased global warming has occurred, many other changes have occurred in other natural systems. Sea levels have risen on average 1.8 mm/yr; precipitation patterns throughout the world have shifted, with some areas becoming wetter and others drier; tropical cyclone activity in the North Atlantic has increased; peak runoff timing of many glacial and snow fed rivers has shifted earlier; as well as numerous other observed conditions. Though it is difficult to prove a definitive cause and effect relationship between global warming and other observed changes to natural systems, there is high confidence in the scientific community that these changes are a direct result of increased global temperatures (IPCC 2007).

California Climate Trends and Associated Impacts

Maximum (daytime) and minimum (nighttime) temperatures are increasing almost everywhere in California, but at different rates. The annual *minimum* temperature averaged over all of California has increased 0.33°F per decade during the period 1920 to 2003, while the average annual *maximum* temperature has increased 0.1°F per decade (Moser et al. 2009).

With respect to California's water resources, the most significant impacts of global warming have been changes to the water cycle and sea level rise. Over the past century, the precipitation mix between snow and rain has shifted in favor of more rainfall and less snow (Mote et al. 2005; Knowles et al. 2006), and snow pack in the Sierra Nevada is melting earlier in spring (Kapnick and Hall 2009). The average early spring snowpack in the Sierra Nevada has decreased by about 10 percent during the last century, a loss of 1.5 million acre-feet of snowpack storage (DWR 2008). These changes have significant implications for water supply, flooding, aquatic ecosystems, energy generation, and recreation throughout the state. During the same period, sea levels along California's coast rose 7 inches (DWR 2008). Sea level rise associated with global warming will continue to threaten coastal lands and infrastructure, increase flooding at the mouths of rivers, place additional stress on levees in the Sacramento-San Joaquin Delta, and intensify the difficulty of managing the Sacramento-San Joaquin Delta as the heart of the state's water supply system.

3.2.4 Environmental Impacts and Mitigation Measures

Thresholds of Significance

Air Quality

Based on Appendix G of the CEQA Guidelines, the SERP would result in a significant impact on air quality if it would:

- conflict with or obstruct implementation of the applicable air quality plan,
- violate any air quality standard or contribute substantially to an existing or projected air quality violation,
- result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors),
- expose sensitive receptors to substantial pollutant concentrations, or
- create objectionable odors affecting a substantial number of people.

As stated in Appendix G of the CEQA Guidelines, the thresholds of significance established by the applicable air quality management or air pollution control district may be relied upon to assess significance under CEQA. Thus, implementation of the SERP would result in significant air quality impacts if:

- local air district-recommended best management practices as required by law are not incorporated into project design or implemented during project construction (see Table 3.2-4);
- temporary construction or long-term operational (regional) emissions would exceed local air district-recommended mass emissions standards as shown in Table 3.2-5;
- long-term operational (local) mobile-source emissions of CO would result in or contribute to CO concentrations that exceed the California 1-hour ambient air quality standard of 20 ppm or the 8-hour standard of 9 ppm; or
- sensitive receptors would be exposed to TAC emissions (e.g., stationary or mobile-source) that exceed 10 chances per million for excess cancer risk and/or a hazard Index of 1 for noncancer risk for the maximally exposed individual.

GLOBAL CLIMATE CHANGE

Based on the 2010 amendments to Appendix G of the CEQA Guidelines, the SERP would result in a significant impact on global climate change if it would:

- generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or,
- conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

Table 3.2-4
Applicable Air District Rules and Regulations

Air District	Counties	Rule
Butte County AQMD	Butte	Rules 200, 201, 202, and 205
Feather River AQMD	Sutter	Rules 3.0, 3.2, and 3.3
Colusa County APCD	Colusa	Rules 2.10, 2.13, 2.15, and 2.16
Yolo-Solano AQMD	Yolo and Solano	Rules 2-5 and 2-11
Sacramento Metropolitan AQMD	Sacramento	Rules 402, 403, 404, and 405

Notes: AQMD = Air Quality Management District, APCD = Air Pollution Control District
Source: ARB 2009

Table 3.2-5
Air District Criteria Air Pollutant and Precursor Mass Emission Thresholds

Air District	Counties	Construction Mass Emission Thresholds			Operational Mass Emission Thresholds		
		ROG	NO_X	PM_{10}	ROG	NO_X	PM_{10}
Butte County AQMD	Butte	25 lb/day	25 lb/day	80 lb/day	25 lb/day	25 lb/day	80 lb/day
Feather River AQMD	Sutter	25 lb/day	25 lb/day	80 lb/day	25 lb/day	25 lb/day	80 lb/day
Colusa County APCD	Colusa	-	-	-	-	-	-
Yolo-Solano AQMD	Yolo and Solano	10 TPY	10 TPY	80 lb/day	10 TPY	10 TPY	80 lb/day
Sacramento Metropolitan AQMD	Sacramento	-	85 lb/day	-	65 lb/day	65 lb/day	-

Notes: APCD = Air Pollution Control District; APD = Air Pollution Department; AQMD = Air Quality Management District; lb/day = pounds per day; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter; ROG = reactive organic gases; TPY = tons per year
Source: BCAQMD, 2008; FRAQMD, 2009; YSAQMD, 2007; SMAQMD, 2009b; Ledbetter pers. comm., 2009; Gomez pers. comm., 2009

None of the relevant local air districts has adopted or proposed GHG emission thresholds. DWR has developed a Climate Action Plan Phase 1: Greenhouse Gas Emissions Reduction Plan. This Plan provides analysis of current and historical GHG emissions from DWR activities, GHG reduction targets of Near-Term Goal at 50% below 1990, and Long-Term Goal at 80% below 1990, and strategies to achieve the GHG reduction targets (DWR 2012). DWR intends to use this Plan to streamline the CEQA cumulative impact analysis of GHG emissions consistent with CEQA Guidelines section 15183.5. To streamline analysis, DWR projects must incorporate relevant reduction measures identified in the Greenhouse Gas Emissions Reduction Plan.

Although the emissions of one single project would not cause global climate change, GHG emissions from multiple projects throughout the world could result in the cumulative impact of global climate change. See Section 5.1, “Cumulative Impacts,” for a complete impact discussion on project-generated GHG emissions.

ANALYSIS METHODOLOGY

Regional and local emissions of criteria air pollutants and precursors, TACs, and odors during construction and operations related to the SERP were assessed in accordance with the methodologies described below.

Construction-related emissions of criteria air pollutants (e.g., PM_{10}), ozone precursors (ROG and NO_X), and GHG emissions were assessed in accordance with methodologies recommended by ARB and local air districts. Where quantification was required, emissions were modeled using the Urban Emissions (URBEMIS) 2007 Version 9.2.4 computer model (Rimpo and Associates 2008). Project-specific data (e.g., construction equipment types and number requirements, maximum daily acreage disturbed) were acquired from DWR for modeling purposes. Modeled construction-related emissions were compared with applicable air district thresholds to determine significance.

Regional operational emissions of criteria air pollutants and precursors (e.g., mobile and area sources) and other air quality impacts (i.e., local emissions of CO, odors, and TACs) were assessed qualitatively in accordance with methodologies recommended by ARB and local air districts.

Potential impacts associated with climate change are addressed in Chapter 5, "Other CEQA-Required Sections," as a part of the cumulative impact analysis.

IMPACT ANALYSIS

IMPACT 3.2-1 ***Construction-Related Emissions that Could Exceed Local Thresholds of Significance.*** *The SERP could result in temporary construction-related emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ that could exceed local air district thresholds of significance. This impact would be* ***potentially significant****.*

Construction emissions are described as temporary in duration and have the potential to represent a significant impact with respect to air quality, especially fugitive dust emissions (PM_{10} and $PM_{2.5}$). Fugitive dust emissions are associated primarily with extensive site preparation activities and vary as a function of such parameters as soil silt content, soil moisture, wind speed, acreage of disturbance area, and miles traveled by construction vehicles on- and off-site. ROG and NO_X emissions are associated primarily with gas and diesel equipment exhaust. Emissions from site preparation (e.g., clearing and grading), material transport, bank stabilization, installation of erosion control features, vegetation planting, and other activities associated with repair of small erosion sites would result in the temporary generation of ROG, NO_X, PM_{10}, and $PM_{2.5}$. On-site construction equipment for these types of activities may include dozers, excavators, haul trucks, barges with cranes, cement mixers with extended arms, and water trucks. In addition, for modeling purposes, approximately 18 truck trips per day carrying 3,900 cubic yards of material were assumed to be required for material delivery and removal.

Construction at each erosion repair site would last for no more than 4 weeks, and up to 15 erosion repairs would be made annually. The maximum acreage disturbed per site would be 0.5 acre or 1,000 linear feet for a Tier 2 project, or 0.1 acre or 264 linear feet for a Tier 1 project.

Temporary construction-generated emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ were modeled using the URBEMIS 2007 Version 9.2.4 computer program. Input parameters were based on default model settings and project-specific information where available (e.g., number and type of equipment, amount of material transport, acreage disturbed). The modeled maximum temporary daily construction emissions are summarized in Table 3.2-6 and described in more detail below and in Appendix C, "Air Quality Modeling Calculations." These quantities represent the amount of emissions per site and do not represent the entire SERP as a whole.

Table 3.2-6
Summary of Modeled Maximum Temporary Construction-Generated Emissions Per Single Erosion Repair Site

Source	ROG	NO_X	PM_{10}	$PM_{2.5}$
Erosion Repair Activities—Single Site (2011)				
Mobile Equipment Exhaust[1]	3 lb/day	26 lb/day	1 lb/day	1 lb/day
Fugitive Dust	–	–	3 lb/day	1 lb/day
Total Maximum Unmitigated (lb/day)	3 lb/day	26 lb/day	4 lb/day	2 lb/day
Total Maximum Mitigated (lb/day)[2]	*2 lb/day*	*21 lb/day*	*1 lb/day*	*0 lb/day*
Annual Total Maximum Unmitigated—15 sites (TPY)[3]	0.2 TPY	2.0 TPY	0.3 TPY	0.2 TPY

Notes: lb/day = pounds per day; ROG = reactive organic gases; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; $PM_{2.5}$ = fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less; TPY = tons per year.

[1] Accounts for employee commute trips, on-site heavy-duty construction equipment operations, and material transport (e.g., soil and aggregate base).

[2] Mitigation Measure 3.2-1 would reduce emissions of ROG and NO_X approximately 20 percent and PM_{10} and $PM_{2.5}$ emissions approximately 75 percent below their unmitigated levels.

[3] Summation of emissions from 15 individual repair sites per year.

See Appendix C for modeling results and assumptions.

Source: Data modeled by AECOM in 2009

As shown in Table 3.2-6, construction-related activities in 2011 would generate daily unmitigated ROG, NO_X, PM_{10}, and $PM_{2.5}$ emissions of 3 lb/day, 26 lb/day, 4 lb/day, and 2 lb/day, respectively, per erosion repair site. Annual SERP-generated construction-related emissions for 15 annual repair sites of unmitigated ROG, NO_X, PM_{10}, and $PM_{2.5}$ would be 0.2 TPY, 2.0 TPY, 0.3 TPY, and 0.2 TPY, respectively. Daily emissions of NO_X would exceed Feather River Air Quality Management District (FRAQMD) and Butte County Air Quality Management District (BCAQMD) applicable thresholds of 25 lb/day.

Mandatory conservation measures in the SERP Manual will require water (e.g., trucks, portable pumps with hoses) to control fugitive dust during temporary access road construction (Section I, "Conservation Measures," of the SERP Manual). In addition, several air districts in the Phase 1 SERP coverage area have not adopted mass emission thresholds for

construction-generated criteria air pollutants and precursors. Instead, these air districts require that standard equipment exhaust (i.e., ROG and NO_X) and fugitive dust control measures (i.e., PM_{10} and $PM_{2.5}$) shall be incorporated into project design and implemented during project construction (BCAQMD 2008, SMAQMD 2009b). Not all measures recommended by the affected air districts for controlling equipment exhaust and fugitive dust emissions are currently incorporated as part of the SERP, and emissions in BCAQMD and FRAQMD could exceed applicable thresholds. Thus, SERP-generated construction-related emissions of criteria air pollutants and precursors could exceed the local FRAQMD and BCAQMD thresholds of significance for NO_X. This impact would be potentially significant.

Mitigation Measure 3.2-1: Implement Applicable Air District–Recommended Mitigation Measures for Particulate Matter and Exhaust Emissions.

DWR will incorporate the following measures to reduce emissions of fugitive dust (PM_{10} and $PM_{2.5}$) during construction activities:

- Comply with applicable air district rules and regulations that pertain to construction activities (e.g., asphalt ROG requirements, administrative requirements, and fugitive dust management practices). As applicable, implement construction-related requirements from air districts or local governments with authority over the project at the commencement of and during each construction activity.
- Do not use open burning to dispose of any excess materials generated during site preparation or other project activities.
- Schedule construction truck trips during nonpeak traffic hours to reduce peak-hour emissions and traffic congestion to the extent feasible.
- Follow air pollution regulations, which includes the use of diesel-powered construction equipment and equipment idle times, that meet CARB's 1996 or newer certification standard for in-use off-road heavy-duty diesel engines [California Code of Regulations: (article 4.8, chapter 9, division 3 of title 13)]
- Maintain all construction equipment in proper working condition and perform all preventative maintenance. Required maintenance includes compliance with all manufacturer's recommendations, proper upkeep and replacement of filters and mufflers, and maintenance of all engine and emissions systems in proper operating condition.
- Check all tires and maintain for proper inflation.

Implementation of the applicable dust and exhaust control measures outlined above under Mitigation Measure 3.2-1 would reduce emissions of ROG and NO_X approximately 20 percent

and PM_{10} and $PM_{2.5}$ approximately 75 percent. Thus, Mitigation Measure 3.2-1 would bring the SERP into compliance with local air district thresholds and recommendations for decreasing emissions of criteria air pollutants and precursors and would reduce this impact to a less-than-significant level.

IMPACT 3.2-2 ***Operations-Related Criteria Pollutants and Precursors that Could Exceed Local Thresholds of Significance.*** *The SERP would not result in long-term operations-related emissions of ROG, NO_X, PM_{10}, or $PM_{2.5}$ that could exceed local air district thresholds of significance. This impact would be* ***less than significant****.*

Long-term operations of the SERP would result in nominal regional emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ from mobile and area sources. No stationary sources of emissions would be created as a result of implementing individual erosion repairs.

Occasional maintenance activities could result in area-source emissions from vegetation management equipment such as chainsaws and trimmers. Mobile-source emissions would result from yearly monitoring visits, material removal, and worker commute trips. Project-generated, regional-area, and mobile-source emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ were modeled using the URBEMIS 2007 Version 9.2.4 computer program. This modeling was based on the assumption that maintenance activities would be conducted 1 week per year per erosion repair site in the Phase 1 SERP coverage area. Default URBEMIS model settings were used.

Table 3.2-7 summarizes the modeled emissions from operational emissions that would be generated by the SERP in year 2011. The emissions modeled were criteria air pollutants and ozone precursors. As summarized in Table 3.2-7, maintenance activities during 1 week of 2011 would result in daily unmitigated emissions of less than 1 lb/day of ROG, NO_X, PM_{10}, and $PM_{2.5}$.

Based on the modeling conducted, emissions of ROG, NO_X, PM_{10}, or $PM_{2.5}$ generated from individual erosion repairs would not exceed any local air district significance thresholds. This impact would be less than significant.

No mitigation is required.

IMPACT 3.2-3 ***Operations-Related Carbon Monoxide (CO) Emissions that Could Exceed Local Thresholds of Significance.*** *Operations-related activities would not result in emissions of CO that exceed the CEQA threshold (20-ppm [1-hour] or 9-ppm [8-hour]). Therefore, this impact would be* ***less than significant****.*

CO concentration is directly related to motor vehicle activity (e.g., idling time and traffic flow conditions), particularly during rush hour, and stable weather conditions with low wind. Under

Table 3.2 -7
Summary of Modeled Maximum Long-Term Operations-Generated Emissions Per Single Erosion Repair Site

Source	ROG	NO_X	PM_{10}	$PM_{2.5}$
Maintenance Activities – Single Site (2011)				
Mobile Equipment Exhaust [1]	0.0 lb/day	0.0 lb/day	0.1 lb/day	0.0 lb/day
Area Sources	0.1 lb/day	0.0 lb/day	0.0 lb/day	0.0 lb/day
Total Maximum Unmitigated (lb/day)	0.1 lb/day	0.0 lb/day	0.1 lb/day	0.0 lb/day
Total Maximum Unmitigated (TPY)[2]	0.0 TPY	0.0 TPY	0.0 TPY	0.0 TPY

Notes: lb/day = pounds per day, ROG = reactive organic gases; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; $PM_{2.5}$ = fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less; APCD = Air Pollution Control District; AQMD = Air Quality Management District; TPY = tons per year.
[1] Accounts for employee commute trips, on-site equipment operations, and material transport (e.g., vegetation waste).
[2] Summation of emissions from 15 single-site repair projects per year
See Appendix C for modeling results and assumptions.
Source: Data modeled by AECOM in 2009

these specific weather conditions, CO concentrations may reach unhealthy levels with respect to residential areas, schools, and hospitals. As a result, local air districts recommend analyzing CO emissions at a local rather than regional level.

The *Transportation Project-Level Carbon Monoxide Protocol* (Garza, Graney, and Sperling 1997:4-5 through 4-9) states that signalized intersections that operate at an unacceptable Level of Service (LOS) represent a potential for a CO violation, also known as a "hot spot," and thus should undergo a quantitative analysis.

According to the transportation analysis prepared for the SERP, SERP operations would not reduce the LOS at any signalized intersections to an unacceptable level (LOS E or F) during any time of the day or substantially worsen LOS at any signalized intersections (see Section XV, "Transportation, Parking, and Circulation," of Appendix A for additional detail). Thus, quantitative analysis is not recommended and long-term local emissions of CO from mobile sources during operations would not exceed the California 20 ppm (1-hour) or 9 ppm (8-hour) standards. As a result, this impact would be less than significant.

No mitigation is required.

IMPACT 3.2-4 ***Exposure of Sensitive Receptors to TAC Emissions.*** *While the SERP would result in some temporary construction-related and minimal long-term operational emissions of TACs, because the use of off-road heavy-duty diesel equipment would be temporary and DWR would comply with applicable rules and regulations that reduce the risk associated with emissions of TACs from stationary sources, project-generated emissions would not expose sensitive receptors to substantial pollutant concentrations. This impact would be* ***less than significant.***

Diesel PM is identified as a TAC by ARB. Construction-related activities would result in temporary project-generated emissions of diesel PM from the exhaust of off-road heavy-duty diesel equipment during site preparation (e.g., excavation, grading, and clearing), materials transport and handling, installation of bank protection materials, and other miscellaneous activities. At this time, local air district policies do not recommend the completion of health risk assessments for construction-related emissions of TACs (ARB 2005).

The dose of a TAC to which receptors are exposed is the primary factor used to determine health risk (i.e., potential exposure to TAC is compared to applicable standards). Dose is a function of the concentration of a substance or substances in the environment and the duration of exposure to the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for the maximally exposed individual. Thus, the risks estimated for a maximally exposed individual are higher if a fixed exposure occurs over a longer period of time. According to the Office of Environmental Health Hazard Assessment, health risk assessments, which determine the exposure of sensitive receptors to TAC emissions, should be based on a 70-year exposure period; however, such assessments should be limited to the period/duration of activities associated with the proposed program (Salinas, pers. comm. 2004).

The project construction period of 4 weeks per erosion site would be much less than the 70-year period used for risk determination. In addition, diesel PM is highly dispersive and studies have shown that measured concentrations of vehicle-related pollutants, including ultra-fine particles, decrease dramatically within approximately 300 feet of the source (Zhu et al. 2002); while the distance to sensitive receptors is not known at this time, heavy equipment would often likely be located at considerable distance from sensitive receptors (i.e., greater than 300 feet) because the Phase 1 waterways are primarily adjacent to rural areas. Because the use of mobilized equipment would be temporary in combination with the dispersive properties of diesel PM and because primary construction activities would not be active for long periods of time within 300 feet of any sensitive receptors, construction-related TAC emissions would not be anticipated to expose sensitive receptors to substantial pollutant concentrations.

No permanent sources of operational TAC emissions would result from implementation of the SERP. Maintenance activities using heavy-duty equipment could produce diesel exhaust emissions during annual maintenance work. Maintenance and monitoring could occur at each

erosion site for approximately 1 day per year. As during site construction, exposure to TACs from maintenance would be much less than the 70-year period used for risk determination and, although the distance to sensitive receptors is not known at this time, heavy equipment would often likely be located greater than 300 feet from sensitive receptors.

Therefore, because the use of off-road heavy-duty diesel equipment would be temporary and operational activities would be minimal, sensitive receptors would not be exposed to substantial pollutant concentrations. Therefore, this impact would be less than significant.

No mitigation is required.

IMPACT 3.2-5 ***Temporary Exposure of Sensitive Receptors to Odors during Construction.*** *The SERP would not introduce new, permanent sources of substantial objectionable odors or locate sensitive receptors significantly closer to existing permanent sources of odors. Odors generated during construction would be temporary, intermittent, and would dissipate quickly. This impact would be* ***less than significant****.*

The occurrence and severity of odor impacts depend on numerous factors, including the nature, frequency, and intensity of the source; wind speed and direction; and the presence of sensitive receptors. While offensive odors rarely cause physical harm, they still can be very unpleasant, leading to considerable distress and often generating citizen complaints to local governments and regulatory agencies.

Construction of individual erosion repairs would result in odors from exhaust emissions from on-site diesel equipment and possible temporary standing water over a period of no more than 2 weeks. The SERP would not introduce new, long-term odor-generating facilities, nor would it place receptors significantly closer to or cause large exposure periods to existing sources of odors. Temporary construction-related odor sources would be intermittent and would dissipate rapidly from the source. Thus, temporary and long-term odor impacts would be less than significant.

No mitigation is required.

3.2.5 RESIDUAL IMPACTS

Implementation of Mitigation Measure 3.2-1 would reduce significant impacts of the SERP from construction-related criteria pollutant emissions to a less-than-significant level. All other impacts relating to air quality are less than significant. No significant and unavoidable impacts would occur. Climate change impacts are addressed in Chapter 5, “Other CEQA-Required Sections,” as a part of the cumulative impact analysis.

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